

Pick a number at random from the numbers listed on the next slide. Remember it. Don't tell anyone else.

1

2

3

4

Now let's see how many people picked each one:

1 - 2

2 - 5

3 - 11

4 - 13

-

What is random???

An outcome is random if we know the **possible** values it can have, but not which **particular** values it takes

Ex: Flipping a coin
Rolling a die
Drawing a card from a deck, looking at the suit
Having a child
Winning the lottery
Making a free throw

So how do we generate these random numbers?

TABLE OF RANDOM DIGITS:

- In book (or given a section on assignments)
- Pick a line to start at, and read across

SIMULATION!

- * assign numbers to each event (based on the event's probability)
- * Use a random number generator (table) to generate these assigned numbers
- * This will simulate the trials happening
- * We can record outcomes from the trials, and look at long run patterns

Example: Rolling a die

1) Identify the events 1, 2, 3, 4, 5, 6

2) Assign the events numbers ↗

3) Read across the table to simulate one trial. Record results.

4) Repeat as needed.

1	2	3	4	5	6
11	11	1		11	.

Example: Picking a card, and looking at the suit

1) Identify the events *Hearts, Spades, Clubs, Diam.*

2) Assign the events numbers *1 2 3 4*

3) Read across the table to simulate one trial. Record results.

4) Repeat as needed.

<i>H</i>	<i>S</i>	<i>C</i>	<i>D</i>
<i>1</i>	<i>11</i>	<i>111 1</i>	

Example1:

A baseball player gets a hit in ~~30%~~^{35%} of his at-bats.
Simulate him coming to bat 10 times.

0-9

1) Identify the events

Hit, Miss

2) Assign the events numbers

↓ ↓
0,1,2 3-9

3) Read across the table to simulate one trial. Record results.

00-29 30-99

4) Repeat as needed.

H	M
11	

Worksheet: Three Children Families Problem

Three Children Families

1- What are the possible outcomes for each child? M, F

2- Are they equally likely? *yes*

3- What could you use as a random generator?

table, coin, die

4- What are the possible outcomes of the random number generator?

0-9 H, T 1-6

5- How would you assign the outcomes of the random generator to the outcomes for each child?

$m = 0-4$

$F = 5-9$

6- How ELSE could you assign the outcomes of the random generator to each child?

M-even

F-odd

7- How many times must the generator be used for one trial?

3

8- How many trials do you think we should perform here?

min 20

39634 62349 74088 65564 16379 19713 39153 69459 17986 24537
 14595 35050 40469 27478 44526 67331 93365 54526 22356 93208

Type of Family	Frequency
No girls	IIII
One girl and two boys	IIII IIII
Two girls and one boy	IIII IIII IIII I
Three girls	III
Total Number of Trials	

Having a boy

- 1- What are the possible outcomes for each child? M, F
- 2- Are they equally likely? yes
- 3- What could you use as a random generator?
- 4- What are the possible outcomes of the random generator?
- 5- How could you assign generator outcomes to each child outcomes?
- 6- How else could you assign these?

same
M: 0-4
F: 5-9

7- How many times must the random generator be used for one trial?

til a boy (infinite?)

8- How many trials should we perform?

min 20

as many as possible

39634 62349 74038 65564 16379 19713 39153 69459 17986 24537
 14595 35050 40469 27478 44526 67331 93365 54526 22356 93208
 30734 71571 83722 79712 25775 65178 07763 82928 31131 30196
 64628 89126 91254 24090 25752 03091 39411 73146 06089 15630
 42831 95113 43511 42082 15140 34733 68076 18292 69486 80468
 80583 70361 41047 26792 78466 03395 17635 09697 82447 31405

Number of Children	Frequency	Relative Frequency
1		
2		
3		
4		
5		
6		
7		
8+		

Football

1- Write instructions for conducting one simulation trial that shows the results for each of the twelve passes in a game

Identify the events: complete, incomplete pass.

State the random generator: table of random digits.

Assign numbers to events: 00-64 → complete
65-99 → incomplete

Number per trial: 12 "passes"

2- Conduct 6 trials. Label the results

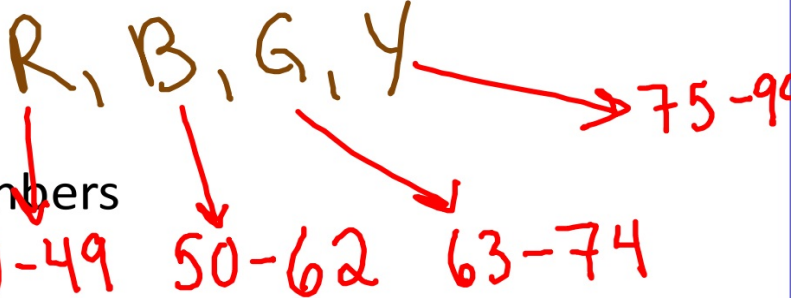
RESULTS:

	Complete	Incomplete	% complete
1			58.3%
2			58.3%
3			66.7%
4			83.3%
5			
6			

3- Based on your results, what is the average number of passes he will make in one game?

Example 2:

A spinner has 4 sections: 50% Red, 13% Blue, 12% Green, 25% Yellow. Simulate spinning the spinner 20 times.

- 1) Identify the events 
- 2) Assign the events numbers
- 3) Read across the table to simulate one trial. Record results.
- 4) Repeat as needed.

2. Conduct 10 trials using the following table of random digits. Be sure to label your results.

³05409 ⁴20830 ⁶01911 ¹60767 ⁴55248 ¹79253 ⁴12317 84120 77772 50103
⁸95336 ¹22530 ⁴91785 ¹80210 34361 52228 33869 94332 83868 61672

3. Based on your simulation what is the chance he will get benched in a game?

1
2
3
4
5
6
7
8
9
10

HW: p. 265

#6, 8, 12, 19